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ABSTRACT

The academic library environment is in transition because of the enormous financial pressures placed on university libraries by simultaneous budget decreases and increased demands for services. Changes brought about by economic restructuring of the scholarly research and publication process, the emergence of a scholarly electronic communication network, and the impact of the evolving electronic university are the three major sources of change. These changes are creating a paradigm shift in the nature of scholarly research, in response to which academic libraries need to create and test new, reformulated, and expanded missions. Tactics that will help university libraries respond to the challenges include selective cancellation of serial titles; changing existing intellectual property statutes to allow more resource sharing; increased networking among many participants in the system of scholarly communication; and the development of creative excitement directed at recasting academic libraries and their missions. (KRN)

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City University of New York Library Association
Collection Development Institute
"Survival Tactics in an Age of Less"
12 April 1991
"Evolving Knowledge Resource Access Systems"
Keynote Address

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U.S. National Commission on Libraries and Information Science

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I. Introduction

We are in the midst of a controversy about the survival of research libraries. The dispute is being fueled by unrelenting increases in scholarly journal prices. Tensions resulting from new technologies and the changing global economic landscape are prompting calls to draft radical new institutional missions for academic and research libraries. With changes in the patterns and conduct of research, the argument goes, our research libraries must change accordingly or they face extinction or irrelevance.

Should university libraries be planning new and revised missions to meet the future needs of students, scholars, researchers, and faculty? How will the needs of these future academic library patrons differ from today's users? Or will the traditional research library mission allow for the integration of new technologies and services with more traditional services? Rutgers' Peter Graham has expressed the dilemma well by asking: "Should libraries only react to changes in their environment, or attempt to act upon that environment?" (Peter S. Graham. "Research patterns and research libraries: what should change?" in College and Research Libraries, July 1989, p. 433)

This paper explores the transitional context of the academic library environment by examining the transformations occurring in the world of scholarly publishing, interconnected network systems, and the conduct of research. The focus is on large and diversified U.S. universities such as the City University of New York (CUNY) System with 200,000 students on 21 campuses -- what the New York Times has recently termed a "huge and often stodgy bureaucracy facing serious financial and educational problems."

The purpose of today's Institute is to explore tactics for the survival of the academic library. In order to be successful, I believe that we will have to go beyond mere survival for academic and research libraries. In an effort to further this possibility, this paper will offer a few personal observations about the academic and research library strategic environment of the next decade.

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My remarks reflect my personal views and do not necessarily reflect the policies of the National Commission on Libraries and Information Science or the White House Conference on Library and Information Services. Planning for WHCLIS, by the way, I am pleased to report, is going extremely well. The focus of this summer's Conference in Washington, D.C. will include issues of primary concern to academic and research libraries.

As librarians, it is our responsibility to foster change where appropriate but also to preserve the historic values of the library profession when required. The success we have in making decisions, in meeting challenges, and in helping to shape our dynamic institutions over the next decade will, in large part, determine the survival of our libraries by the evolution of new missions, or our institutional decline in an age of reduced resources.

II. Challenges facing Academic and Research Libraries

How can research libraries respond to the multiple challenges presented by: declining collection budgets; escalating prices of scholarly journals; rapid deterioration of print collections; increased internationalization of scholarly media; fluctuations in world currency rates; increasingly specialized nature of scholarly sub-disciplines; and the proliferation of scholarly information resources in digital and other formats? Each of these challenges places financial pressure on the university library, along with increased demand for a wider variety of information support services, at a time of financial stringency and budgetary reductions.

The forces creating these challenges for the academic and research library community result, in large part, from the following three sources:

1.) an economic restructuring of the scholarly research and publication process;
2.) the emergence of a scholarly electronic communication network;
3.) the impact of the evolving electronic university on the academic and research library.

This paper examines the impact of these three sources of change. It assumes that academic and research library collection development and management concerns are components of a coherent system of scholarly communication. Further, it assumes that the system of scholarly interaction and research exchange is currently facing structural changes.

Over the last two decades, technology has influenced scholarship and the conduct of research. The extent of this change and the degree to which academic libraries respond to

these forces, however, is not a subject of universal agreement. Although we speak of "access replacing ownership" for college and university libraries, few would argue that our traditional print-library and organizational structures provide the resilient environment needed to plan the research library of the twenty-first century. As USC's Peter Lyman has phrased it in a recent article in Change (Jan/Feb, 1991, p. 34):

"The system of scholarly communication is in crisis. It cannot be revived by returning to traditional models, for the origins of the crisis are to be found in radical changes in the economics of the traditional print library, in addition to fundamental changes in the nature of scholarly communication brought about by technology."

We require a process for creating and testing new, reformulated, and expanded missions for our university and research institutions. These missions must balance our concern for maintaining the professional values and traditions associated with preserving the intellectual record, while addressing the demand for new services, and new approaches toward collecting and delivering scholarly resources to meet the changing needs of research and instruction in the world of higher education.

The title of this paper, "Evolving Knowledge Resource Access Systems," conveys a sense of the opportunity and potential that academic librarians have for a dialogue about what new missions and services are needed to support the dynamic instructional and complex research missions of their parent institutions. The title does not connote a tone of imminent disaster which often characterizes recent hard decisions by academic and research librarians responsible for collection development deselection projects.

Rather, the title recognizes that in facing the current challenge there is the seed of creativity and evolutionary development made possible by the shifting paradigm of scholarship. The title also acknowledges that the evolution of new knowledge access systems is underway. The roles research libraries play in this evolving interconnected global network must be clearly identified in order to clarify the place of the university library in the life of the scholar.

III. The crisis in academic and research libraries

What is the nature of the crisis in the system of scholarly communication? Are our traditional models for exchange of learned information, research results, and scholarship no longer functional? Has the adoption of technology fundamentally changed the nature of research and knowledge representation? Are the radical economic changes affecting the traditional print

collections of the academic and research library indicative of the imminent demise of the entire system? Is the "information age" about to claim the research library as an institutional casualty?

In a more specific sense, are the rates of increase for subscription prices to scholarly journals over the past decade a fair reflection of publisher's cost increases, or are certain non-domestic commercial scholarly publishers charging prices set to drive exorbitant profits from the U.S. market? Is there merit to complaints that faculty and researchers are overpublishing in efforts to achieve academic tenure and promotion? Is all that is published actually necessary? Will the scholarly publishing industry of the future provide network access to scholarly information directly to students, faculty, and researchers, by-passing the college and university library?

In order to respond to these questions and to plan tactical actions to address the current academic library collection development crisis, the strategic trends influencing the global knowledge environment need projection and analysis. If we frame the problem carefully and objectively, we might in the process be able to identify possible solutions.

IV. Scholarly Journal Pricing Trends

So then, what recent trends are reflected in scholarly journal subscription prices? In statistics reported by the U.S. Department of Education's National Center for Education Statistics (NCES) through the Integrated Postsecondary Education Data System (IPEDS) for 1988, the nation's 3,400 academic and research libraries spent a total of $462 million for 6.4 million current periodical subscriptions. If current pricing trends continue at their present rate, these same libraries will spend $1.1 billion for these same serial subscriptions in 1995. This projection is important because the total 1988 acquisition expenses for these same institutions was $1.3 billion. It appears that the university library actually has become what University of Virginia librarian Ray Frantz has characterized as "The serials doomsday machine." (Publishers Weekly, 8 February 1991)

Research libraries are hardest hit by recent scholarly journal subscription price escalation. Kendon Stubbs from the University of Virginia, writing in the introduction to the Association of Research Libraries (ARL) Statistics for 1989-90 notes that "...median serials expenditures rose 52% from 1986 to 1990. In the same four years, however, the prices paid by [research] libraries rose 51%, to a median price of $132.45 per subscription." Thus, the 94 U.S. ARL universities, spending $259 million for serials in 1989, are receiving roughly the same number of subscriptions that cost $165 million in 1986, a

difference of $94 million.

Where did research university libraries find this additional $100 million over four years? ARL statistics indicate widespread cancellations of high-priced serials, reduced monographic expenditures, and increased interlibrary loan. Despite this, the total number of serial subscriptions is no greater in 1989/90 than 1986 levels. Median figures for ARL university libraries show that 58% of library materials budgets is spent on serials; and overall, 35% of total annual operating expenditures is going toward materials, with 50% to salaries. If current trends continue at the same rate, ARL university libraries will be spending 80% of their entire acquisitions budgets on current serial subscriptions by 1995.

If the CUNY libraries, with 25,000 current serial subscriptions and a declining serials budget of $2.7 million, were to be compared with ARL universities, CUNY would rank 12th in serial titles purchased and 34th in serial expenditures for 1989/90. The difference in ranking for these two comparisons is most likely due to differences in the composition of the CUNY library system title mix compared with the ARL member institutions. At an average subscription price of $97.40, CUNY system libraries are paying 36% less per title than the typical ARL university library. Even though the CUNY libraries are not buying the STM mixture commonly found in ARL, six CUNY libraries have cancelled over $700,000 worth of serial subscriptions in the past three years. The problems of the university community are painfully illustrated by CUNY's dilemma.

Recent trends in scholarly journal prices have been well documented in the library literature. Examples include the following:

"Much has been written about the prices of journals. Librarians are told each year about rates of inflation; subscription prices in various subjects are compared; the evils of institutional or library pricing are decried. We hear that U.S. libraries are being overcharged for their foreign journals and that exchange rates are being unfairly applied." -- Sandra Moline ("The influence of subject, publisher type, and quantity published on journal prices" in The Journal of Academic Librarianship, vol 15, no 1, March, 1989, pp. 12.)

"In recent years considerable attention has focused on dramatic price increases among scholarly journals, yet this is but one element in a "double explosion" -- an explosion in price and quantity -- that has characterized scholarly journals and devastated libraries' budgets." -- Dennis Corrigan, ("The political economy of scholarly communication and the American system of higher education." in The Journal of Academic Librarianship, vol 15, no. 6, January, 1990, p. 332.)

"The venerable, centuries-old system of scholarly publishing and collection building in research libraries is in very real danger of collapse. Dramatic increases in both the numbers and prices of scholarly journals, especially scientific scholarly journals, are the most obvious manifestation of this impending crisis....To date, none of the attempts by research libraries to cope with these dual crises of information glut and spiraling price inflation have been very successful. In fact, the most common strategies, that is, pleading for a larger acquisitions budget, or transferring dollars from monographs to the serials budget, have actually aggravated the problem by accommodating or hiding it rather than dealing with underlying causes." -- Gary D. Byrd ("An economic "commons" tragedy for research libraries: scholarly journal publishing and pricing trends." in College and Research Libraries, May, 1990, p. 184)

"Research library collections have faced a complex budget squeeze for more than ten years. Escalating prices and burgeoning numbers of journals combined with limited budgets have placed tremendous pressure on research libraries to maintain a "balanced" collection of serials and monographs to meet the educational and research requirements of students and faculty." Robin B. Devin and Martha Kellogg ("The serial/monograph ration in research libraries: budgeting in light of citation studies." in College and Research Libraries, January, 1990, p. 47)

It is clear that academic librarians have been writing about the serials pricing problem in the library literature. In an ironic twist, articles about the price increases appear in the very scholarly communication vehicles which are the subject of concern. Clearly, scholarly journal price increases over the past few years demonstrate the need for a rigorous economic analysis of recent trends and pricing practices.

As we have observed, scholarly journal publishers argue that price increases to libraries result from overall increases in the fixed and variable costs of publishing, and that discriminatory pricing policies by which libraries are charged substantially higher prices than individual subscribers are justified by the fact that many readers will benefit from a single institutional subscription. These arguments would appear to be cogent, if it were not for the difficulties which force university libraries to cancel serial titles in order to afford subscriptions to a reduced title list.

Can we attribute rising prices of scholarly resources chiefly to publisher strategies aimed at achieving a monopoly over the communication of research? Or, are they the result of

other forces and actually symptoms of a paradigm shift in the research process? Further, are these forces destabilizing universities and national research policy in general? The solution to our research library budget crisis may lie outside the control of the university library, depending on the answers to these questions.

V. The economic restructuring of scholarly publishing

Journal articles published in scholarly sources provide a means for facilitating specialized communication among learned colleagues, as well as a mechanism allowing scholars, scientists, and researchers to be in touch with one another between formal meetings. An ancillary use also allows students to share in the process. The scholarly journal was designed originally to mediate the separation of time and distance between conferences and meetings. They served as a channel of communication for gathering intellectuals together, to transmit ideas, exchange thoughts, and to pass messages through a print technology adapted specifically for a regular and systematic process. Journals, unlike monographs, were intended to continue indefinitely just as consistent publisher revenues were meant to flow continuously through subscription sales.

As with all products of collective human activity, the scholarly journal has fostered certain cultural attitudes and behavioral customs which are appropriate to the specific "society." Certain subjective or psychological factors are important to the maintenance of the culture and values common to the printed scholarly journal as it exists today. The formal mechanisms for editing, reviewing, and critically assessing the scholarly merit of peers' work reflect a culture developed over many generations. The scholarly communication process embodied in the academic journal reflects those values that form the bedrock foundation of the academic community's very identity. Roots of the system of scholarly publishing are intertwined with the university reward mechanism forming a unified whole which is amazingly resistant to change.

The intellectual community functions performed by the scholarly journal allow for critical review by peers with dissenting or contrary views. This process has components to assure the freedom required to perpetuate the community of scholars, while, at the same time, allowing revolutionary concepts to surface which challenge accepted truths.

But what happens then when the machinery of scholarship is endangered by economic and technological forces which are beyond the control of the system itself? What happens when the system of scholarly communication itself is threatened by a paradigm shift?

In order to place this issue in perspective, it is useful to review a recent macro-economic commentary. Writing in a recent Chronicle of Higher Education article, Kevin Kearns presents an alternate view of today's global economic landscape:

"The American economy today is being radically transformed by the trade and foreign-investment patterns established by the rise of Japan, the economic integration of Europe, and the de-industrialization of the United States....in spite of the massive changes under way, much of the academic community acts as though it's business as usual.

"The vast majority of our economic and political thinkers....believe that the free market is busy allocating resources in the most efficient way possible, and that our nation will be better off for the changes. Unfortunately, they're dead wrong....A battle is raging today for control of critical technologies and sectors of the U.S. economy, with accompanying effects on our political system....To withstand the challenge to our economic and political way of life, we must change the way we think about doing business.

"Members of the academy cannot stand aloof in this time of crisis and wait to write the history or rewrite their theories after the fact. Neither should they be permitted to explain away predatory foreign behavior by spouting theory that does not apply to the globalized marketplace. We need our best academic minds to help formulate a new national economic strategy now." (Kevin L. Kearns, Senior Fellow at the Economic Strategy Institute, writing in the March 27, 1991 Chronicle of Higher Education (p.B1-3).

This view of the changing global economic picture helps to place the serials pricing crisis and the research paradigm shift into a larger context. If Kearns economic conceptualization is correct, the research library economic crisis goes beyond our serials budget difficulties and, indeed, goes beyond the university. If correct, the crisis is one of global concern and has a direct bearing on the nation's future economic competitiveness and productivity.

VI. The emerging electronic scholarly communication network

One national program receiving significant attention from the university community involves the development of a digital national network which could serve as the basis of a new electronic paradigm for scholarly communication in the future. During the last five years, legislation has been introduced in Congress calling for the establishment of a high-capacity, broadband, advanced national data communications network for research. Over the years, congressional interest has grown as

this concept has evolved into a plan for an integrated national research and education network (NREN) consisting of an advanced communication network linked to a variety of computational and information facilities and services.

Senate bill 272, introduced by Senator Albert Gore early in the first session of the 102nd Congress, acknowledges that information resources are being linked as common resources throughout networks to users at desktop workstations. The NREN legislation addresses the need for better coordination in the design and operation of these systems. The infrastructure of this interlinked set of technologies is considered by some to be a strong basis for the development of a universal broadband information system. A very high-capacity digital communication network and information service, as visualized, would carry entertainment, educational, and social services to the home and support a broad range of business and educational services. A nationwide network for research and education could be a starting point and gradually broaden the vision.

Even considered apart from the economic crisis facing research libraries, digital technology is fostering change in the representation and distribution of knowledge. Like other units in the campus community, libraries in the recent past have used technology to automate internal procedures and records. The focus today is more on knowledge and access issues which involve the university library in joint efforts with campus computing centers to plan for NREN implementation through organizations like the Coalition for Networked Information.

The difficulty with a vision that looks to NREN to solve our economic problems is that the costs and policies associated with the emerging digital national network are not well known, especially since InterNet, or the defacto NREN, currently receives federal subsidy. Nor, for that matter, are the roles of government, the private sector, or university libraries well defined in our vision of the emerging national digital highway. Work of the recently formed CNI Taskforces in clarifying portions of the NREN vision is extremely useful, but the affect of technological innovation on the social relationships and organizational forms with which we manage scholarly communication today are virtually unknown. We need to understand the impact of technology on traditional scholarly values, academic accountability, and intellectual independence.

VII. <u>The academic library and the electronic university</u>.

The mission of the research university is evolving in response to the adoption of new electronic technology. Symptoms of change are to be found in the conduct of today's research and in the transition to the wired campus of the future. Students of the future will use interactive multimedia technology, in

conjunction with more traditional printed text. For example, students will soon be able to view various interpretations of dramatic scenes or interactively explicate the historical context of a particular phrase or poem. In another application, students can explore Mayan ruins or the detail of Michelangelo's Pieta using a system employing the photographic realism of high definition color image display, videos of scholarly lectures, and systems which enable the student to interact with resource material in a more direct and realistic way. The next decade will bring dramatic changes resulting from an historic transition away from the manufacturing of print products towards distributing information resources.

These changes reflect the changing nature of relationships in the research and teaching communities. The following points provide an indication of some of these changes in the conduct of research and the implications of these changes on the missions of university libraries:

1. Research has become increasingly analytic. This trend results in a greater concentration on quantitative information and data, rather than a dependence on the published results of research.

2. More research is being performed by teams of specialists, often working in collegial networks or co-laboratories which span the globe. The consequence of this trend is a greater use of informal reports shared among peers in the "invisible college" and a greater reliance on the data produced by prior studies, rather than full published research outcomes.

3. Research is increasingly directed toward solving a specific problem. This application orientation places less emphasis on performing exhaustive review of the published literature, especially if solutions can be developed without the investment of time in researching the literature of prior investigations.

4. The growing volume of research literature increases the difficulty of managing information, interpreting data, and filtering massive volumes of research.

5. Research incentives (especially in the scientific, technical, and medical fields) are increasingly competitive in nature, especially when federal government grants are involved, but also with international awards and private support of university-based research programs.

6. Research is increasingly specialized, with branching and "twigging" often occurring for fields which are sub-sets of other specialized areas. These twig fields require specialized literature support for practitioners.

7. Research is increasingly cross or inter disciplinary requiring researchers to draw from near or allied, or even non related subject literature in order to obtain literature in support of team activities.

8. Access to published research by non-research-oriented students is increasing. Even high school students, as well as undergraduates and non-institutional researchers are demanding access to scholarly articles.

9. The costs of performing research are increasing and are beginning to threaten those institutions which have been both the leading research and teaching universities. If these schools can only afford to perform research, the medieval model of the university may be history.

Review of the basic research model places these trends into perspective. Research, especially scientific-based research, is performed in order to foster creativity and discovery. The success of research demands that discoveries must be shared in order to expose the original thought, idea, or discovery to a critical community which can either verify, appreciate, and replicate the results, or show the originator that the truth is different.

Science in its most rudimentary sense, finds order and meaning in our experience. Human progress often involves the discovery of a new order which gives unity to what seemed unlike. The act of creation lies in the discovery of a hidden likeness. This act is original, but the knowledge created is universal because each of us re-creates it as we re-discover the truths first uncovered by the originator.

At the time of Scientific Revolution in the 16th century, most wealth resulted from trade. It was therefore natural that science focused on problems of trade, navigation, and exchange. The Industrial Revolution in the eighteenth century shifted the source of wealth from trade to manufacturing requiring greater amounts of mechanical energy. Science has therefore been preoccupied well into the twentieth century with problems concerned with energy sources.

Recently, our Post Industrial "Information Revolution" finds scientific interests moving away from the generation of energy, to its control and manipulation, particularly in the form of the control of power processes such as the digital computer and the associated network communications infrastructure.

A characteristic invention of the Scientific Revolution was the telescope. The characteristic invention of the Industrial

Revolution was the power machine performing the routine work of human muscle. The characteristic invention of the Post-Industrial Revolution is the control mechanism which performs the routine work of the human brain. Scientists invented the computer to serve research needs during World War II. The invention of the printing press in the 15th century created the conditions for the development and flourishing of modern science and scholarship. Not only did the press allow authors to communicate their ideas accurately, but the qualities of the medium stimulated entirely new methods and institutions of learning.

Electronic information technology is similarly changing the nature of basic research. The character of research -- the way data are collected, analyzed, studied, and communicated -- has changed because of technology. Similarly, the data generated by research is growing at unprecedented rates. The human genome database is projected to eventually contain over 3 billion units of information. Earth observation experiments in space will collect and sent to earth trillions of units of data daily. A single image of the U.S., with resolution to a square yard, contains nearly a trillion data points.

The changes in research libraries over the last two decades have paralleled changes in the research and the university communities. The same technology which facilitated the automation of university library internal procedures over the past decade is influencing the larger arena of our parent institutions. Those same digital computational and communication technologies which brought us internal process control systems are now functioning as the raw material for rebuilding the infrastructure of much university and research activity.

Similarly, the cultural values reflected in academic status and tenure issues, peer review of research, and generally accepted notions of value within the scholarly "economic" arena are undergoing review and examination. Public concern about recent incidents of scientific fraud, inaccurate research data, and professional misconduct are symptomatic of a wider concern about the increasingly competitive nature of activities related to academic prestige and federal grant awards.

Another important area of concern is reflected in policy questions about the ownership of intellectual property in the emerging electronic network and the relationships between owners of scholarly information resources, libraries, and the users of these resources in an electronic environment. Two recent court decisions provide a glimpse of future concerns (and confusions) about intellectual property ownership in the emerging national digital network.

One is the settlement of a copyright infringement suit

against Kinko's Graphics Corp. which operates a chain of photocopying stores frequently located near college campuses. The plaintiffs, including several major academic publishers, represented by counsel from the American Association of Publishers, charged that two Kinko's stores copied excerpts from 12 of their books, compiled the excerpts into five 'packets', or anthologies, and sold these packets to students attending classes at NYU, the New School, and Columbia. The case was decided by U.S. District Court for the Southern District of New York. The Judge awarded the plaintiff publishers' statutory damages and injunctive relief for the copyshop's willful infringement, after rejecting the defendant's claim that its service is necessary to the educational process. Damages totalled $510,000. This is likely to become an important court decision affecting the climate for future copyright infringement suits brought by owners for liberal interpretations of the 'fair use' provision of the Copyright Law.

In another recent copyright court decision, a 27 March unanimous Supreme Court action involves the protection of factual material compilations. In this case the court denied copyright protection for the alphabetical listing of names and addresses in the white pages of a phone directory. The case illustrates that copyright protection is inappropriate for compilations which do not reflect original selection or arrangement. While it has been a tenant of copyright for some time that facts cannot be copyrighted, this ruling will likely cause database publishers to think twice about making the investment of time and effort required to compile factual material. (New York Times, 3/28/91)

In the volatile and changing climate of legal, technical, and economic transition, what tactical actions can collection development librarians in universities pursue? The tactical options are grouped below:

1. Financial and Economic Concerns:

Even if the CUNY libraries were in a position to restore cuts and increase the size of the serials budget to cover scholarly journal subscription price increases, this would not solve the problem. Such a tactical response is but a temporary solution to the crisis. Scholarly journal publishers would most likely respond by increasing subscription prices based on the new elasticity of market demand. If libraries continue to meet increased serials prices through budget reallocation from other areas of operational expenses, the situation will continue to degrade over time. A stronger, but more painful, financial tactic is the selective cancellation of serial titles based on clear and balanced criteria reflecting the priorities of the parent institutional system.

Cancellations require careful planning to be effective. Comparisons of duplicate subscriptions or multiple subscriptions to the same journal, serials index service, or CD ROM-based system should serve as the basis for shared subscription negotiations with publishers. Document delivery of articles among the CUNY libraries could provide economic efficiencies even without program consolidation with the system. With this city as the base for many non-domestic scholarly publishers, CUNY libraries could approach selected suppliers with innovative proposals which test a number of different use-based article services, in paper or electronic formats, to provide practical experience with non-subscription delivery alternatives.

Distribution of information is closely related ed to pricing. What is needed is more information to compare old and new methods of distribution to determine those features that are complementary and those that serve different roles. Currently, for instance, the needs for archiving and for disseminating scholarly information are merged in a single mechanism: the scholarly journal. Separating the issues associated with these two functions may help to sharpen and extend the development of possible future scenarios for electronic publishing, electronic journals, and electronic articles.

We have been assuming that the new electronic network for scholars will come about through large systems in comprehensive offerings. This is not usually the way change occurs. It is much more likely that successful changes will begin small and grow over time. Institutions such as CUNY, that experience drastic cuts are challenged to experiment with radical and innovative ways of addressing the threats of change. The opportunity for developing and experimenting with new economic models for serials services may come along with the trauma of even deeper budget cuts forced by the State, that present the university libraries with no other choice but consideration or radical new measures.

2. Legal and Ownership Concerns:

Reasserting university ownership of scholarly journals and the encouragement of faculty to cease publishing in premier scholarly journals that charge excessive subscription prices would, if consistently applied, bring about change. In reality, however, this is not guaranteed to produce changes in researchers' publishing patterns or on demand for scholarly works. Changes to the existing intellectual property statutes to allow more resource sharing among university libraries under a more liberally constructed "fair use" provision could allow research libraries to substitute article document delivery in lieu of paid subscriptions to scholarly journals.

Exploration of site licenses or flat-priced institution-wide

licenses for university systems could provide a reasonable financial alternative to the cancellation of individual subscriptions. Careful consideration should be given to shared collection development, resource sharing, and article delivery arrangements because of the impact these measures have on the traditional mission of the research library.

The area of intellectual property ownership is complex and not always benign for academic librarians. Experiments with alternative systems require specific contractual terms which protect parties from possible liabilities. In essence, the legal policies which govern the economic relationships between parties are the most complex aspect of the emerging new systems for delivery of scholarly information.

3.) Network Resourse Sharing and Delivery Concerns:

Continued reduction of acquisition budgets and cancelation of expensive scholarly journal subscriptions quickly are forcing university libraries to extend new electronic document delivery services through which articles are scanned or faxed directly to the patron. Resource sharing and document delivery activities require standard technology platforms and uniform mechanisms for accessing, representing, and delivery of bibliographic information, as well as intellectual content in a variety of formats and media.

A critical element in the exploitation of the network linking technology is the need to understand the scholar's needs and to comprehend the behavioral differences between print expression and interactive knowledge representation technology. We should probably stop talking about the electronic journal or the electronic library. The analog may, in the long run, be more confusing than helpful.

4.) Strategic Policy Concerns:

In order to foster change, experimentation, and innovation the university library community should develop closer links with the many participants in the system of scholarly communication. Librarians from the research arena need to participate in interdisciplinary forums to discuss the solutions as well as the problems. We can use our strengths in the preservation arena to address problems of technology integration into other areas of professional concern.

Our efforts to influence policy must recognize that, while we may not be in control of pricing, we do have natural allies among faculty and researchers who play a critically important role in scholarly communication policies. Our efforts should be directed towards encouraging publishers to employ responsible pricing policies. We should be seeking strategic alliances and

proposing new pricing models for testing which would allow publishers of scholarly works to gain experience with new methods of dissemination. One such model might involve discussion of a scholarly network patterned after the Corporation for Public Broadcasting as described by John Witherspoon at the CNI meeting on March 18, 1991.

We need to bear in mind that research libraries and scholarly publishers have a system of mutual dependency. Future systems of scholarly communication must acknowledge these relationships and build upon them through mutual trust and responsible action.

VII. Conclusion

Finally, I would submit to you that currently academic and research libraries need a resurgence of creative excitement directed at recasting our institutions and our professional mission. This creative thrust is especially needed in the face of the very serious erosion threatening our budgets and scholarly resources in what has been termed the "library doomsday machine." To counter this, we need new missions which emphasize the renewal potential of knowledge representation technology.

What is at stake in the current crisis is not simply the viability of the research library in the future; we face the even greater potential erosion of research objectivity and validity. University libraries don't need more money to buy more scholarly journals. Rather, they need strategies to address the changes caused by a newly developing paradigm for research. These strategies must transfer the spirit of democratic community and scholarly values of research to the emerging electronic university. The spirit of excitement and discovery, the joy of creativity, and the human potential for freedom released by scholarship and learning demand that the commitment of our discipline be directed toward the rejuvenation and remediation of knowledge services to scholars.

Thank you for your kind attention to these concerns.